

Epidemiologic
Surveillance

Annual Report for

**Pantex
Plant**

1994

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Prepared by the Epidemiologic
Surveillance Data Center, a
joint program of the Oak Ridge
Institute for Science and
Education in conjunction with
the Office of Epidemiologic
Studies, U.S. Department of
Energy



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This annual report is sponsored by the U.S. Department of Energy. It is based on information submitted by participating laboratories. The views and opinions expressed in this report are those of its authors and do not necessarily reflect the views of the U.S. Government, its agencies, or its employees.

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Foreword

The U.S. Department of Energy (DOE) is committed to assuring the health and safety of its workers through the development of epidemiologic surveillance activities. An epidemiologic surveillance program was implemented at selected DOE sites during the past several years. This approach has been expanded to include surveillance of all medical conditions that result in an absence of 5 or more consecutive workdays, occupational injuries and illnesses, and deaths among active employees. This annual epidemiologic surveillance report provides the final summary of the 12-month period, January 1, 1994 through December 31, 1994, for the Pantex Plant.

Caution is required when comparing this information with that of other DOE facilities. Interpretation of these data must take into account the occupational medicine program, health and safety practices, the composition of the work force, and potential occupational exposures unique to this facility; therefore, the data presented are pertinent only to the Pantex Plant. Continuing surveillance and data examination may suggest emerging trends that change the preliminary interpretation of the data.

Plans for future annual reports include a discussion of important new findings and changes occurring since previous reports and the incorporation of information from the National Center for Health Statistics and the National Cancer Institute's Surveillance, Epidemiology, and End-Results Program. This information will allow early recognition

and investigation of possible work-related problems, as well as an analysis of trends over time. In addition, the results of epidemiologic surveillance will be combined with those of medical and exposure surveillance to form an integrated approach to worker health protection.

Pantex at a Glance: 1994

- This report marks the first annual Epidemiologic Surveillance report for the Pantex Plant.
- About 5% of the Pantex work force experienced at least 1 absence of 5 or more days because of illness or injury.
- Among men, the highest diagnosis rate was for diseases of the musculoskeletal system (11.5 per 1,000); among women, the highest diagnosis rate involved respiratory diseases (19.0 per 1,000). The respiratory diagnosis rate was more than twice as high for women as for men.
- Overall, diagnosis rates were almost twice as high for hourly workers as for salaried workers. Among men, hourly workers reported diagnosis rates over 2.5 times that of salaried workers. By contrast, the diagnosis rate among women in salaried occupations was about 1.5 times that of hourly workers.
- One hundred fifty-four OSHA-recordable events were reported. The diagnosis rate for OSHA-reportable events was very similar for women and men, with the rates for sprains and strains highest among the various injuries reported to the Occupational Safety and Health Administration (OSHA).
- Five OSHA-recordable cases of toxic effects of exposures were noted: 2 cases of carbon monoxide exposure, 1 of isocyanate, 1 involving cleaning fluid, and 1 other involving unspecified fumes.

Introduction

Epidemiologic surveillance at U.S. Department of Energy (DOE) facilities consists of regular and systematic collection, analysis, and interpretation of data on absences due to illness and injury in the work force. Its purpose is to provide an early warning system for health problems occurring among employees at participating sites. Data are collected by coordinators at each site and submitted to the Epidemiologic Surveillance Data Center, located at the Oak Ridge Institute for Science and Education, which carries out quality control procedures and analyses. Rates of absences and rates of diagnoses associated with absences are analyzed by occupation and other relevant variables. They may be compared with the disease experience of different groups within the DOE work force, as well as with populations that do not work for DOE, to identify disease patterns or clusters that may be associated with work activities.

In this annual report, the 1994 morbidity data for the Pantex Plant are summarized. These analyses focus on absences of 5 or more consecutive workdays occurring among workers aged 19-79 years. They are arranged in 5 sets of tables that present: 1) the distribution of the labor force by occupational category and salary status; 2) the absences per person, diagnoses per absence, and diagnosis

rates for the whole work force; 3) diagnosis rates by type of disease or injury; 4) diagnosis rates by occupational category; and 5) relative risks for specific types of disease or injury by occupational category.

In addition to this information, the report contains health events that are considered recordable by the Occupational Safety and Health Administration (OSHA). The analyses of the OSHA data are arranged like the absences of 5 or more consecutive workdays. OSHA-recordable events are those that occurred on the job and involve fatalities (regardless of the time between the injury and death); lost workday cases other than fatalities; and nonfatal cases without lost workdays resulting in transfer to another job, termination of employment, medical treatment other than first aid, loss of consciousness, or restriction of work or motion. Also recordable are any diagnosed occupational health events reported to the employer that are neither fatal nor result in lost workdays. Deaths occurring among active workers are listed separately; and are not included in any tables. All rates presented in this report are age-adjusted (see glossary) and represent the number of diagnoses reported per 1,000.

The tables show the results of analyses of diagnoses resulting from *absences*. An absence is defined as a period of 5 or more consecutive workdays away from work because of some health problem such as an illness or injury. In tables presenting

analyses of *diagnoses*, each diagnosis is counted because a diagnosis is for a specific illness or injury. A worker can have more than one diagnosis related to one absence from work. For example, a worker's single absence might involve both a back injury and pneumonia. Unlike analyses of absences, analyses of diagnoses focus on the rates of occurrence of specific types of disease and injury. Thus the worker with one absence in which he had a back injury and pneumonia would be counted twice in the analysis of diagnoses, because two separate diagnoses are recorded for this one absence.

The data included in this report are supplemental to, but do not replace, those reported in other safety, industrial hygiene, and health physics reports prepared by DOE. No attempt has been made to validate diagnoses with medical records, pathology, or other laboratory reports. Also, no attempt has been made to validate occupational information.

Facility Overview

Built by the Army Ordnance Corps in 1942, Pantex was used during World War II to load conventional munitions (bombs and artillery shells) with TNT.

In 1950, although an assembly facility was already in operation in Burlington, Iowa, the Atomic Energy Commission (AEC) decided that a second assembly plant was needed. During late 1950 and 1951, the Pantex Plant was rehabilitated, and it began full operation in May 1952, with Proctor & Gamble as the operating contractor. With some exceptions, Pantex evolved into the assembly facility for warheads designed by the Lawrence Livermore National Laboratory, while warheads designed at Los Alamos were assembled in Burlington. In 1956, Mason & Hanger replaced Proctor & Gamble as the plant contractors.

Today, weapons disassembly is conducted at the Pantex Plant near Amarillo, Texas — a facility with more than 323 buildings and 1,900,000 square feet of work space. Warheads built in the 1960s, particularly army artillery shells and Lance missile warheads, are being disassembled first. Disassembly is essentially a reversal of the assembly process and each warhead requires an estimated 1-2 weeks for complete disassembly. First, the chemical high explosive is separated from the nuclear components in an “assembly cell.” These cells (also called “gravel gerties” for their gravel ceilings designed to collapse and contain the contents in the event of an accident) are specially reinforced rooms capable of withstanding an explosion equivalent to 250 kilograms of TNT. Eleven of Pantex’s 13 assembly cells are used for disassembly, and approximately 60 assembly bays are used to further break down sub-assemblies and components for salvage or disposal.

After disassembly, warhead components containing uranium are returned to the Y-12 Plant at Oak Ridge, Tennessee, for storage or processing. Lithium-6 deuteride components — the hydrogen bomb fusion material — is also sent back to Oak Ridge. Tritium is shipped to Savannah River, South Carolina. The high explosives are burned at the Pantex Plant.

The future plans for Pantex currently include continued weapons disassembly through the end of this decade.

Labor Force by Occupational Category and Salary Status, 1994

During 1994, there were 3,402 employees (aged 19-79) identified by Pantex as participants in epidemiologic surveillance. Seventy-three percent (2,483 workers) were men and 27% (919 workers) were women. Eighty-two percent (2,781 workers) were Caucasian, 10% (335 workers) were Hispanic, and 6% (217 workers) were African American. The remaining 2% (69 workers) included Asians and Native Americans.

The composition of the labor force by occupational category and salary status is given in Table 1. The occupational categories used in the table are based on the occupation and industry codes created by the Bureau of the Census in 1980. Because

workers can change occupational category over the course of a year, workers were counted in the occupational category where they spent most of their time during the year.

Seventy-five percent of the workers were salaried, whereas 25% were hourly. The occupational categories

with the largest number of employees were office management and administration (43%) and technical support (21%).

	Occupational Category	Number of Workers in 1994	Number of Workers in 1993	% Change from Last Year
Salaried	Office Management and Administration	1,454	N/A	N/A
	Engineers, Scientists, and Health Care Workers	404	N/A	N/A
	Technical Support	706	N/A	N/A
	Subtotal	2,564	N/A	N/A
Hourly	Service	545	N/A	N/A
	Crafts and Repair	293	N/A	N/A
	Subtotal	838	N/A	N/A
	TOTAL	3,402	N/A	N/A

Table 1.
Labor Force by Occupational Category and Salary Status

Absences Among Work Force, 1994

Absences per Person. In 1994, 159 Pantex employees reported an absence of 5 or more consecutive workdays because of illness or injury. Twelve (8%) of these workers had 2 or more absences. A total of 177 absences were reported by all employees (Table 2.A).

Diagnoses per Absence. A total of 213 diagnoses were associated with the 177 absences of 5 or more consecutive workdays. Multiple diagnoses were reported for 34 (19%) absences (Table 2.B).

Diagnosis Rates. In 1994, diagnoses noted for absences of 5 or more consecutive workdays yielded

an age-adjusted rate of 61.1 diagnoses per 1,000 persons. The diagnosis rate for women (91.0 per 1,000) was 80% higher than the rate for men (49.4 per 1,000) (Table 2.C).

Employee Category	Number of Workers	Number of Absences					Total Persons Absent at Least Once	Total Number of Absences
		0	1	2	3	4		
Male	2,483	2,383	91	5	3	1	100	114
Female	919	860	56	2	1	0	59	63
TOTAL	3,402	3,243	147	7	4	1	159	177

Table 2.A.
Absences per Person

Employee Category	Number of Diagnoses per Absence			Total Number of Absences	Total Number of Diagnoses†
	1	2	3		
Male	89	24	1	114	140
Female	54	8	1	63	73
TOTAL	143	32	2	177	213

Table 2.B.
Diagnoses per Absence

Employee Category	Number of Workers	Number of Diagnoses†	Crude Rate per 1,000	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Male	2,483	140	56.4	49.4	41.5	58.7
Female	919	73	79.4	91.0	70.6	117.3
TOTAL	3,402	213	62.6	61.1	52.9	70.5

Table 2.C.
Diagnosis Rates

† Includes all diagnoses reported with an absence of 5 or more days, including absences for pregnancy and delivery.

* Standardized to age distribution of 1970 U.S. population.

Diseases and Injuries by Diagnostic Category, 1994

The age-adjusted diagnosis rate for each diagnostic category is given for all workers and separately for each gender (Tables 3-5). The diagnosis rates are given by gender to further describe the disease and injury patterns in the work force (Tables 4 and 5). Diagnoses associated with pregnancy, labor, and delivery are described in Table 6. As Table 3 shows, the three diagnostic categories with the highest rates were diseases of the respiratory system (11.2 per 1,000), diseases of the musculoskeletal system (11.1 per 1,000), and injury and poisonings (9.7 per 1,000). Together, these three categories accounted for 54% of all diagnoses.

Men. The diagnostic category with the highest rate among men (Table 4) was diseases of the musculoskeletal system (11.5 per 1,000), with 32 diagnoses reported among 24 men. This category accounted for 23% of all diagnoses among men. Fourteen diagnoses were related to dorsopathies (spinal disorders), 7 to arthritis, 3 to rheumatism (excluding the back), 4 to other joint disorders,

3 to derangement of the joint, and 1 to deformities of the toes. Seven men had multiple diagnoses.

The second highest rate, accounting for 18% of the total diagnoses, was injury and poisoning (9.7 per 1,000), with 25 diagnoses reported for 23 men. Within this category, one subcategory had relatively high numbers of diagnoses. Sprains and strains accounted for 56% of the injury and poisoning diagnoses, with 14 diagnoses among 13 men. Six diagnoses were sprains and strains of the back, 5 of the lower extremities, 1 of the upper extremities, and 2 of unspecified sites. One man had multiple diagnoses. Diseases of the respiratory system (7.9 per 1,000) ranked third, with 26 diagnoses reported for 21 men. Thirteen diagnoses were related to upper respiratory diseases: 8 to chronic respiratory conditions and 5 to pneumonia/bronchitis. Four men had multiple diagnoses.

Two diagnoses related to cancer were reported among 2 men in 1994. One man had a malignant melanoma of the skin of the ear, and the other had kidney cancer.

Women. The diagnostic category with the highest rate among women (Table 5) was diseases of the respiratory system (19.0 per 1,000), with 19

diagnoses reported among 18 women. This accounted for 26% of all diagnoses among women. Sixteen diagnoses were related to upper respiratory diseases, 2 to pneumonia/bronchitis, and 1 to chronic respiratory conditions. One woman had multiple diagnoses.

The second highest rate, making up 15% of the total diagnoses, was for diseases of the digestive system (16.9 per 1,000), with 11 diagnoses among 8 women. Four diagnoses were related to gall bladder disease, 3 to gastroenteritis/colitis, and 1 each to a hernia, periodontitis, and rectal/anal hemorrhage. Two women had multiple diagnoses.

Pregnancy and childbirth (14.3 per 1,000) ranked third, with 12 diagnoses reported for 12 women.

One cancer diagnosis was reported among women in 1994. The woman had carcinoma *in situ* of the breast.

Category of Diagnoses	ICD9-CM Code	Number of Diagnoses†	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Infections and parasitic diseases	001-139	3	0.8	0.3	2.6
Malignant neoplasms	140-208, 230-234	3	0.8	0.2	2.4
• Digestive organs	150-159	0			
• Respiratory system	160-165	0			
• Breast	174-175	0			
• Genitourinary	179-189	1	0.3	0.0	2.2
• Nervous system	191-192	0			
• Leukemia, lymphoma	200-208	0			
Benign neoplasms and other	210-229, 235-239	2	0.5	0.1	2.2
Endocrine and metabolic diseases	240-279	3	0.9	0.3	2.7
Blood and blood-forming organs	280-289	2	0.5	0.1	2.1
Mental disorders	290-319	4	1.0	0.4	2.7
• Alcoholism	303	0			
• Drug abuse	304-305	1	0.2	0.0	1.6
Nervous system and sense organs	320-389	5	1.4	0.6	3.5
Circulatory system	390-459	11	3.2	1.8	5.9
• Hypertension	401	4	1.0	0.4	2.9
• Acute myocardial infarction	410	0			
• Ischemic disease, not M.I.	411-414, 429.2	2	0.6	0.2	2.5
• Cerebrovascular disease	430-438	1	0.3	0.0	2.2
Respiratory system	460-519	45	11.2	8.2	15.3
• Upper respiratory	460-465, 470-478	29	7.4	5.0	11.1
• Pneumonia/bronchitis	466, 480-487	7	1.6	0.8	3.5
• Chronic respiratory conditions	490-496	9	2.1	1.1	4.1
Digestive system	520-579	31	9.0	6.3	13.0
• Hernias	550-553	10	2.6	1.4	4.9
• Gall bladder disease	574-575	6	1.9	0.8	4.2
Genitourinary system	580-629	10	2.7	1.4	5.1
• Benign prostatic hypertrophy	600	1	0.3	0.0	2.2
• Endometriosis	617	0			
• Ovarian cysts	620.0-620.2	0			
• Female genital pain/bleeding	625-626	0			
Pregnancy and childbirth	630-676	12	14.3	7.6	27.1
Skin and subcutaneous tissue	680-709	2	0.5	0.1	2.1
Musculoskeletal	710-739	38	11.1	7.9	15.6
• Dorsopathies system	720-724	16	4.6	2.7	7.8
Congenital anomalies	740-759	0			
Certain perinatal conditions	760-779	0			
Symptoms, signs, and ill-defined conditions	780-799	9	2.6	1.4	5.1
Injury and poisoning	800-999	31	9.7	6.6	14.2
• Fractures, all sites	800-829	5	1.3	0.5	3.1
• Dislocations	830-839	4	1.4	0.4	4.2
• Sprains and strains	840-848	16	5.0	2.9	8.6
• Intracranial injuries	850-854	0			
• Internal injuries	860-869	0			
• Open wounds	870-897	3	1.2	0.3	4.2
• Other injuries	900-999	3	0.9	0.3	2.7
Family status/health service contract	V01-V82	2	0.4	0.1	1.5
• Family history of health problems	V10-V19	0			
• Circumstances related to reproduction/development	V20-V28	2	0.4	0.1	1.5
• Specific procedure/aftercare	V50-V59	0			
Total minus pregnancies		201	56.4	48.7	65.3
TOTAL		213	61.1	52.9	70.5

Table 3.
Diseases and Injuries by Diagnostic Category — Males and Females

† Includes all diagnoses reported with an absence of 5 or more days.

* Standardized to age distribution of 1970 U.S. population.

Category of Diagnoses	ICD9-CM Code	Number of Diagnoses†	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Infections and parasitic diseases	001-139	2	0.6	0.2	2.5
Malignant neoplasms	140-208, 230-234	2	0.7	0.2	2.7
• Digestive organs	150-159	0			
• Respiratory system	160-165	0			
• Breast	174-175	0			
• Genitourinary	179-189	1	0.4	0.1	2.5
• Nervous system	191-192	0			
• Leukemia, lymphoma	200-208	0			
Benign neoplasms and other	210-229, 235-239	1	0.4	0.1	2.9
Endocrine and metabolic diseases	240-279	3	1.0	0.3	3.2
Blood and blood-forming organs	280-289	1	0.4	0.1	2.9
Mental disorders	290-319	2	0.7	0.2	3.0
• Alcoholism	303	0			
• Drug abuse	304-305	1	0.3	0.0	2.3
Nervous system and sense organs	320-389	4	1.3	0.5	3.6
Circulatory system	390-459	10	3.7	2.0	6.9
• Hypertension	401	4	1.4	0.5	3.7
• Acute myocardial infarction	410	0			
• Ischemic disease, not M.I.	411-414, 429.2	2	0.8	0.2	3.1
• Cerebrovascular disease	430-438	0			
Respiratory system	460-519	26	7.9	5.3	11.6
• Upper respiratory	460-465, 470-478	13	3.9	2.3	6.8
• Pneumonia/bronchitis	466, 480-487	5	1.5	0.6	3.6
• Chronic respiratory conditions	490-496	8	2.5	1.2	4.9
Digestive system	520-579	20	7.0	4.5	10.9
• Hernias	550-553	9	3.0	1.6	5.9
• Gall bladder disease	574-575	2	0.8	0.2	3.1
Genitourinary system	580-629	4	1.3	0.5	3.5
• Benign prostatic hypertrophy	600	1	0.4	0.1	2.5
• Endometriosis	617	0			
• Ovarian cysts	620.0-620.2	0			
• Female genital pain/bleeding	625-626	0			
Pregnancy and childbirth	630-676	0			
Skin and subcutaneous tissue	680-709	1	0.4	0.1	2.9
Musculoskeletal	710-739	32	11.5	8.0	16.6
• Dorsopathies system	720-724	14	5.4	3.0	9.6
Congenital anomalies	740-759	0			
Certain perinatal conditions	760-779	0			
Symptoms, signs, and ill-defined conditions	780-799	7	2.6	1.2	5.5
Injury and poisoning	800-999	25	9.7	6.3	15.0
• Fractures, all sites	800-829	3	1.0	0.3	3.2
• Dislocations	830-839	3	0.9	0.3	2.8
• Sprains and strains	840-848	14	5.5	3.1	9.7
• Intracranial injuries	850-854	0			
• Internal injuries	860-869	0			
• Open wounds	870-897	3	1.6	0.4	6.2
• Other injuries	900-999	2	0.7	0.2	2.7
Family status/health service contract	V01-V82	0			
• Family history of health problems	V10-V19	0			
• Circumstances related to reproduction/development	V20-V28	0			
• Specific procedure/aftercare	V50-V59	0			
TOTAL		140	49.4	41.5	58.7

Table 4.
Diseases and Injuries
by Diagnostic
Category — Males

† Includes all diagnoses reported with an absence of 5 or more days.
* Standardized to age distribution of 1970 U.S. population.

Category of Diagnoses	ICD9-CM Code	Number of Diagnoses†	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Infections and parasitic diseases	001-139	1	2.3	0.3	16.5
Malignant neoplasms	140-208, 230-234	1	0.8	0.1	5.8
• Digestive organs	150-159	0			
• Respiratory system	160-165	0			
• Breast	174-175	0			
• Genitourinary	179-189	0			
• Nervous system	191-192	0			
• Leukemia, lymphoma	200-208	0			
Benign neoplasms and other	210-229, 235-239	1	0.8	0.1	5.8
Endocrine and metabolic diseases	240-279	0			
Blood and blood-forming organs	280-289	1	0.7	0.1	4.8
Mental disorders	290-319	2	1.6	0.4	6.6
• Alcoholism	303	0			
• Drug abuse	304-305	0			
Nervous system and sense organs	320-389	1	2.3	0.3	16.5
Circulatory system	390-459	1	1.4	0.2	9.8
• Hypertension	401	0			
• Acute myocardial infarction	410	0			
• Ischemic disease, not M.I.	411-414, 429.2	0			
• Cerebrovascular disease	430-438	1	1.4	0.2	9.8
Respiratory system	460-519	19	19.0	11.7	30.9
• Upper respiratory	460-465, 470-478	16	15.5	9.1	26.5
• Pneumonia/bronchitis	466, 480-487	2	2.0	0.5	8.9
• Chronic respiratory conditions	490-496	1	1.4	0.2	9.8
Digestive system	520-579	11	16.9	9.1	31.3
• Hernias	550-553	1	1.4	0.2	9.3
• Gall bladder disease	574-575	4	5.5	2.1	14.7
Genitourinary system	580-629	6	10.8	4.5	25.6
• Benign prostatic hypertrophy	600	0			
• Endometriosis	617	0			
• Ovarian cysts	620.0-620.2	0			
• Female genital pain/bleeding	625-626	0			
Pregnancy and childbirth ¹	630-676	12	14.3	7.6	27.1
Skin and subcutaneous tissue	680-709	1	0.7	0.1	4.8
Musculoskeletal	710-739	6	8.5	3.6	20.1
• Dorsopathies system	720-724	2	2.0	0.5	8.9
Congenital anomalies	740-759	0			
Certain perinatal conditions	760-779	0			
Symptoms, signs, and ill-defined conditions	780-799	2	2.0	0.5	8.9
Injury and poisoning	800-999	6	7.5	3.2	17.9
• Fractures, all sites	800-829	2	1.5	0.4	6.0
• Dislocations	830-839	1	1.9	0.3	13.7
• Sprains and strains	840-848	2	2.7	0.6	12.2
• Intracranial injuries	850-854	0			
• Internal injuries	860-869	0			
• Open wounds	870-897	0			
• Other injuries	900-999	1	1.4	0.2	9.8
Family status/health service contract	V01-V82	2	1.3	0.3	5.4
• Family history of health problems	V10-V19	0			
• Circumstances related to reproduction/development	V20-V28	2	1.3	0.3	5.4
• Specific procedure/aftercare	V50-V59	0			
Total minus pregnancies		61	76.7	58.1	101.2
TOTAL		73	91.0	70.6	117.3

Table 5.
Diseases and Injuries
by Diagnostic
Category — Females

† Includes all diagnoses reported with an absence of 5 or more days.

* Standardized to age distribution of 1970 U.S. population.

¹ Only women age 18-45 years were included in the calculation of the rates for these diagnostic categories.

Diagnoses Associated with Pregnancy, Labor, and Delivery

During 1994, 12 pregnancy-related diagnoses were reported among 12 women (Table 6). Two diagnoses were for complications related to pregnancy and 1 diagnosis was for ectopic and molar pregnancy/abortive outcomes. Nine women had normal deliveries.

Diagnoses by Occupational Category, 1994

During 1994, the age-adjusted diagnosis rate for all employees (Table 7) was nearly 2 times higher among hourly workers than salaried workers (98.6 versus 52.2 per 1,000 persons). Crafts and repair workers, who comprised 9% of the work force, had the highest diagnosis rate (112.1 per 1,000), with 32 diagnoses reported for 18 workers. Service workers had the second highest diagnosis rate (87.3 per 1,000), with 44 diagnoses reported among 32 persons. Technical support workers

ranked third, with 53 diagnoses reported for 41 workers (68.9 per 1,000). Engineers, scientists, and health care workers had the lowest rate (5.6 per 1,000 workers), with 3 diagnoses among 3 workers.

Men. The diagnosis rate among men (Table 8) was more than 2.5 times higher for hourly workers (98.5 per 1,000) than for salaried workers (35.2 per 1,000). Crafts and repair workers had the highest rate (112.5 per 1,000), with 32 diagnoses reported for 18 men. The second highest rate was among service workers (87.6 per 1,000), with 35 diagnoses reported among 24 men. Technical support workers ranked third, with 33 diagnoses reported among 25 men (48.7 per 1,000). Engineers, scientists, and health care workers had the lowest rate (6.8 per 1,000), with 3 diagnoses for 3 men.

Women. The diagnosis rate among women (Table 9) was higher for salaried workers (94.1 per 1,000) than for hourly workers (63.4 per 1,000). Technical support workers had the highest rate (152.6 per 1,000), with 20 diagnoses reported among 16 women. The second highest rate was among office management and administration (88.4 per 1,000), with 44 diagnoses reported among 35 women. Service workers ranked third, with 9 diagnoses reported among 8 women (64.9 per 1,000). Neither the crafts and repair workers nor the engineers, scientists, and health care workers had any diagnoses among women. Overall, the women had higher diagnosis rates than the men, which suggests a greater tendency among women to report injury or illness.

Category of Diagnoses	ICD9-CM Code	Number of Diagnoses†	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Ectopic and Molar Pregnancy/Abortive Outcome	630-639	1	0.7	0.1	4.8
Complications Related to Pregnancy	640-648	2	1.3	0.3	5.4
Normal Delivery	650	9	12.3	6.0	25.2
Other Indications for Care in Pregnancy, Labor, and Delivery‡	651-659	0			
Complications of Labor, Delivery, and Puerperium	660-676	0			
TOTAL		12	14.3	7.6	27.1

Table 6. Diagnoses Associated with Pregnancy, Labor, and Delivery

†Includes all diagnoses reported with an absence of 5 or more days.

*Only women aged 18-45 were included in the calculation of the rates for these diagnostic categories.

‡Includes delivery by cesarian section and multiple births.

	Occupational Category	Number of Workers	Number of Diagnoses†	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Salaried	Office Management and Administration	1,454	81	57.8	45.3	73.8
	Engineers, Scientists, and Health Care	404	3	5.6	1.8	17.7
	Technical Support	706	53	68.9	51.6	91.9
	Subtotal	2,564	137	52.2	43.6	62.4
Hourly	Service	545	44	87.3	61.5	124.1
	Crafts and Repair	293	32	112.1	72.9	172.3
	Subtotal	838	76	98.6	76.8	126.6
TOTAL	3,402	213	61.1	52.9	70.5	

Table 7.
Diagnoses by Occupational Category — Males and Females

	Occupational Category	Number of Workers	Number of Diagnoses†	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Salaried	Office Management and Administration	868	37	36.3	25.7	51.3
	Engineers, Scientists, and Health Care	333	3	6.8	2.2	21.4
	Technical Support	554	33	48.7	34.5	68.6
	Subtotal	1,755	73	35.2	27.8	44.6
Hourly	Service	438	35	87.6	59.7	128.5
	Crafts and Repair	290	32	112.5	73.3	172.9
	Subtotal	728	67	98.5	75.7	128.0
TOTAL	2,483	140	49.4	41.5	58.7	

Table 8.
Diagnoses by Occupational Category — Males

	Occupational Category	Number of Workers	Number of Diagnoses†	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Salaried	Office Management and Administration	586	44	88.4	63.4	123.4
	Engineers, Scientists, and Health Care	71	0			
	Technical Support	152	20	152.6	95.9	242.7
	Subtotal	809	64	94.1	72.0	123.0
Hourly	Service	107	9	64.9	31.4	133.9
	Crafts and Repair	3	0			
	Subtotal	110	9	63.4	30.6	131.3
TOTAL	919	73	91.0	70.6	117.3	

Table 9.
Diagnoses by Occupational Category — Females

† Includes all diagnoses reported with an absence of 5 or more days, including absences for pregnancy and childbirth.

* Standardized to age distribution of 1970 U.S. population.

Deaths Among Active Workers, 1994

There were seven deaths reported among active workers in 1994.

Three were due to cancer, 3 to cardiovascular disease, and 1 to an immune deficiency.

Relative Risk for All Diseases and Injuries by Occupation

In Tables 10 and 11.A through 11.G, the risk of one or more absences associated with selected diagnostic categories for specific occupational categories is compared with all other occupational categories in the Pantex work force. This comparison takes into account the possible confounding effects of age and gender. In contrast to the previous series of tables, these analyses examine the risk of a worker having *one or more* absences for 5 or more consecutive workdays during 1994. This was done to minimize the problem associated with one person having multiple absences for the same condition.

Throughout this report various tables and discussions refer to rates of illness or injury. Rates in this report reflect the number of events (e.g., absences, diagnoses) per 1,000 "person-years." A "person-year" is a unit of measurement combining persons and time; it is equivalent to

one person followed up for one year. When an individual worker remains in the work force for the entire year, she or he contributes one person-year to the calculation of rates of disease and injury presented in the report. Rates of disease and injury are often presented as the number of diagnoses or absences from work per thousand workers per year, or per 1,000 person-years.

The statistical methods used to compare the incidence of absences are the relative risk and the 95% confidence interval. The relative risk (RR) is the rate of absence in one group divided by the rate in a reference (comparison) group. The reference group is all workers other than the occupational category of primary interest. A relative risk of *1.0* indicates that both groups have the same risk of absence. A relative risk *greater than 1.0* indicates that workers in a selected occupational category have a higher risk of absence than workers in all other occupational categories combined. A relative risk *less than 1.0* implies that the selected occupational group has a lower risk of absence compared with all other occupational categories combined.

The confidence interval is a statistical measure of the precision of the risk estimate. A 95% confidence interval indicates the range in which one would expect the relative risk to fall 95% of the time. If the confidence interval includes the value 1.0, then the rate of absence is likely to have occurred by chance; in other words, the relative risk is not statistically significant at the 95% confidence level. For example, a relative risk of 2.0 with a confidence interval of *0.9 to 2.1* would not be considered statistically significant, whereas a relative risk of 1.4 with a confidence interval of *1.2 to 1.7* would be considered statistically significant. The width of the confidence interval indicates the amount of uncertainty in the risk estimate and is affected by sample size and the number of events in the diagnostic category.

None of the occupational categories were at a statistically significant increased risk of being absent 5 or more consecutive workdays in 1994. Engineers, scientists, and health care workers (RR=0.2) had a statistically significant decreased risk of absence (Table 10).

Occupational Category	Person-Years	Persons with at Least One Event*	Relative Risk**	Lower 95% Confidence Limit	Upper 95% Confidence Limit
Office Management and Administration	1,454	65	0.8	0.6	1.1
Engineers, Scientists, and Health Care	404	3	0.2	0.05	0.5
Technical Support	706	41	1.3	0.9	1.9
Service	545	32	1.5	1.0	2.2
Crafts and Repair	293	18	1.6	1.0	2.6
TOTAL	3,402	159			

* Persons with multiple absences during the time period were counted only once.
 ** Adjusted for age and gender - compared with all occupational categories.

Table 10.
All Diseases and Injuries by Occupational Categories

Relative Risk for Selected Disease and Injury Categories by Occupation

Tables 11.A through 11.G present the relative risk of an absence of 5 or more consecutive workdays for selected disease categories among workers by each occupational category. These show that service workers were significantly more likely to be absent at least once during 1994 for diseases of the respiratory system (RR=3.2).

Crafts and repair workers were significantly more likely to be absent at least once during 1994 for diseases

of the digestive system (RR=3.4), diseases of the musculoskeletal system (RR=3.8), and injury and poisoning (RR=2.7).

The lower overall diagnosis rates observed among salaried workers were also apparent in the relative risk analyses. Office management and administration workers were significantly less likely to be absent at least once during 1994 for diseases of the digestive system (RR=0.2).

The reasons for the large differences in overall diagnosis rates and relative risks for particular diagnostic categories among different occupational categories may be due to low numbers. However, the consistency of the differences across broad diagnostic categories suggests that compliance with reporting back to work through an occupational physician varies among occupational categories.

Occupational Category	Person-Years	Persons with at Least One Event*	Relative Risk**	Lower 95% Confidence Limit	Upper 95% Confidence Limit
Office Management and Administration	1,454	1	0.4	0.01	12.4
Engineers, Scientists, and Health Care	404	0			
Technical Support	706	1	1.8	0.2	19.9
Service	545	1	3.6	0.4	33.2
Crafts and Repair	293	0			
TOTAL	3,402	3			

Table 11.A.
Malignant Neoplasms

Occupational Category	Person-Years	Persons with at Least One Event*	Relative Risk**	Lower 95% Confidence Limit	Upper 95% Confidence Limit
Office Management and Administration	1,454	2	0.3	0.1	1.8
Engineers, Scientists, and Health Care	404	0			
Technical Support	706	5	3.2	0.9	11.2
Service	545	1	0.8	0.1	7.7
Crafts and Repair	293	2	2.1	0.4	9.7
TOTAL	3,402	10			

Table 11.B.
Diseases of the Circulatory System

Occupational Category	Person-Years	Persons with at Least One Event*	Relative Risk**	Lower 95% Confidence Limit	Upper 95% Confidence Limit
Office Management and Administration	1,454	13	0.5	0.2	1.0
Engineers, Scientists, and Health Care	404	0			
Technical Support	706	10	1.4	0.7	2.9
Service	545	14	3.2	1.6	6.4
Crafts and Repair	293	2	0.7	0.2	3.1
TOTAL	3,402	39			

Table 11.C.
Diseases of the Respiratory System

* Persons with multiple absences during the time period were counted only once.
** Adjusted for age and gender – compared with all occupational categories.

Occupational Category	Person-Years	Persons with at Least One Event*	Relative Risk**	Lower 95% Confidence Limit	Upper 95% Confidence Limit
Office Management and Administration	1,454	5	0.2	0.1	0.7
Engineers, Scientists, and Health Care	404	2	0.8	0.2	3.3
Technical Support	706	6	1.1	0.4	2.6
Service	545	7	2.2	0.9	5.4
Crafts and Repair	293	6	3.4	1.3	9.0
TOTAL	3,402	26			

Table 11.D.
Diseases of the Digestive System

Occupational Category	Person-Years	Persons with at Least One Event*	Relative Risk**	Lower 95% Confidence Limit	Upper 95% Confidence Limit
Office Management and Administration	1,454	16	1.6	0.8	3.4
Engineers, Scientists, and Health Care	404	1	0.3	0.04	1.9
Technical Support	706	2	0.2	0.1	1.0
Service	545	3	0.7	0.2	2.1
Crafts and Repair	293	8	3.8	1.7	8.8
TOTAL	3,402	30			

Table 11.E.
Diseases of the Musculoskeletal System

Occupational Category	Person-Years	Persons with at Least One Event*	Relative Risk**	Lower 95% Confidence Limit	Upper 95% Confidence Limit
Office Management and Administration	1,454	8	0.5	0.2	1.2
Engineers, Scientists, and Health Care	404	0			
Technical Support	706	10	1.8	0.9	4.0
Service	545	5	1.3	0.5	3.3
Crafts and Repair	293	6	2.7	1.1	6.9
TOTAL	3,402	29			

Table 11.F.
Injury and Poisoning

Occupational Category	Person-Years	Persons with at Least One Event*	Relative Risk**	Lower 95% Confidence Limit	Upper 95% Confidence Limit
Office Management and Administration	1,454	4	0.5	0.1	1.8
Engineers, Scientists, and Health Care	404	0			
Technical Support	706	6	2.2	0.8	6.3
Service	545	3	1.6	0.5	5.3
Crafts and Repair	293	2	1.4	0.3	6.2
TOTAL	3,402	15			

Table 11.G.
Injury and Poisoning: Sprains and Strains

* Persons with multiple absences during the time period were counted only once.
** Adjusted for age and gender – compared with all occupational categories.

OSHA-Recordable Events Among Work Force, 1994

Events per Person. In 1994, 142 Pantex employees had an OSHA-recordable event. Three (2%) of these workers had 2 events. A total of 145 OSHA-recordable events occurred among all employees (Table 12.A).

Diagnoses per Event. A total of 154 diagnoses were associated with the 145 OSHA events recorded during 1994. Multiple diagnoses were reported for eight (6%) of the events (Table 12.B).

Diagnosis Rates. In 1994, the 154 diagnoses noted for the OSHA events yielded an age-adjusted rate of 44.9 per 1,000 persons. The age-adjusted diagnosis rate for women (47.1 per 1,000) was similar to the rate for men (43.7 per 1,000) (Table 12.C).

Employee Category	Number of Workers	Number of OSHA-Recordable Events					Total Persons with at Least One Event	Total Number of Events
		0	1	2	3	4		
Male	2,483	2,380	101	2	0	0	103	105
Female	919	880	38	1	0	0	39	40
TOTAL	3,402	3,260	139	3	0	0	142	145

Table 12.A.
OSHA-Recordable Events per Person

Employee Category	Number of Diagnoses per OSHA Event					Total Number of Events	Total Number of Diagnoses
	1	2	3	4	5		
Male	100	4	1	0	0	105	111
Female	37	3	0	0	0	40	43
TOTAL	137	7	1	0	0	145	154

Table 12.B.
Diagnoses per OSHA-Recordable Event

Employee Category	Number of Workers	Number of Diagnoses	Crude Rate per 1,000	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Male	2,483	111	44.7	43.7	35.3	54.0
Female	919	43	46.8	47.1	33.7	65.8
TOTAL	3,402	154	45.3	44.9	37.5	53.6

Table 12.C.
Diagnosis Rates for OSHA-Recordable Events

* Standardized to age distribution of 1970 U.S. population.

OSHA Diseases and Injuries by Diagnostic Category, 1994

The age-adjusted diagnosis rate for each diagnostic category is presented for all workers combined and by gender (Tables 13-15). Tables 14 and 15 show the diagnosis rates by gender to further describe the disease and injury patterns in the work force. As Table 13 shows, the diagnostic category with the highest rate was injury and poisoning (39.0 per 1,000), with 135 diagnoses reported for 126 people, which accounted for 88% of all the diagnoses. Within this category were three subcategories with relatively high rates. Sprains and strains (17.1 per 1,000), with 58 diagnoses among 56 workers; open wounds (9.8 per 1,000), with 32 diagnoses among 32 workers; and “other” injuries (10.9 per 1,000), with 39 diagnoses among 35 workers.

Men. The leading diagnostic category among men (Table 14), accounting for 90% of all diagnoses, was injury and poisoning (38.9 per 1,000), with 100 diagnoses among 94 men.

Within this category were three subcategories with relatively high rates. Sprains and strains (14.6 per 1,000) accounted for 39% of the diagnoses, with 39 diagnoses among 38 men. Fifteen diagnoses were sprains and strains of the back, 13 of the lower body, 10 of the upper body, and 1 of an ill-defined site. One man had multiple diagnoses. Open wounds (11.9 per 1,000) accounted for 28% of the injury and poisoning diagnoses, with 28 diagnoses among 28 men. Nineteen diagnoses were for open wounds of the fingers and hands, 4 were of the head and neck, 3 of the upper body, and 2 of the lower body. “Other” injuries (11.6 per 1,000) accounted for 30% of the injury and poisoning diagnoses, with 30 diagnoses among 27 men. These included 11 diagnoses for contusions — 4 head and neck, 2 trunk, and 5 limbs; five toxic effects of gases, fumes, or vapors — 2 carbon monoxide, 1 isocyanate, 1 laundry cleaning fluid, and 1 unspecified fumes; five burns — 3 second-degree, 1 first-degree, and 1 unspecified-degree; 5 foreign bodies on the eye; 2 other injuries; 1 abrasion/friction burn; and 1 bronchitis caused by reduced temperature.

Women. The diagnostic category with the highest rate was the same among women as for men (Table 15): injury and poisoning (39.0 per 1,000) accounted for 81% of all diagnoses, with 35 diagnoses among 32 women. Within this category were two subcategories with relatively high rates. Sprains and strains (22.4 per 1,000) accounted for 54% of the diagnoses, with 19 diagnoses for 18 women. Eight of these were sprains and strains of the back, 6 of the lower body, and 5 of the shoulder. One woman had multiple diagnoses. “Other” injuries (10.1 per 1,000) accounted for 26% of the injury and poisoning diagnoses, with 9 diagnoses for 8 women. These included 6 diagnoses for contusions, 1 second-degree burn, 1 superficial injury to the eye, and 1 injury to the hand. One woman had multiple diagnoses.

Category of Diagnoses	ICD9-CM Code	Number of Diagnoses†	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Infections and parasitic diseases	001-139	0			
Malignant neoplasms	140-208, 230-234	0			
• Digestive organs	150-159	0			
• Respiratory system	160-165	0			
• Breast	174-175	0			
• Genitourinary	179-189	0			
• Nervous system	191-192	0			
• Leukemia, lymphoma	200-208	0			
Benign neoplasms and other	210-229, 235-239	0			
Endocrine and metabolic diseases	240-279	0			
Blood and blood-forming organs	280-289	0			
Mental disorders	290-319	2	0.4	0.1	1.5
• Alcoholism	303	0			
• Drug abuse	304-305	0			
Nervous system and sense organs	320-389	2	0.4	0.1	1.7
Circulatory system	390-459	0			
• Hypertension	401	0			
• Acute myocardial infarction	410	0			
• Ischemic disease, not M.I.	411-414, 429.2	0			
• Cerebrovascular disease	430-438	0			
Respiratory system	460-519	3	0.8	0.2	2.4
• Upper respiratory	460-465, 470-478	0			
• Pneumonia/bronchitis	466, 480-487	1	0.2	0.0	1.6
• Chronic respiratory conditions	490-496	1	0.2	0.0	1.6
Digestive system	520-579	1	0.2	0.0	1.4
• Hernias	550-553	1	0.2	0.0	1.4
• Gall bladder disease	574-575	0			
Genitourinary system	580-629	0			
• Benign prostatic hypertrophy	600	0			
• Endometriosis	617	0			
• Ovarian cysts	620.0-620.2	0			
• Female genital pain/bleeding	625-626	0			
Pregnancy and childbirth	630-676	0			
Skin and subcutaneous tissue	680-709	8	2.9	1.3	6.7
Musculoskeletal	710-739	2	0.9	0.2	4.2
• Dorsopathies system	720-724	0			
Congenital anomalies	740-759	0			
Certain perinatal conditions	760-779	0			
Symptoms, signs, and ill-defined conditions	780-799	1	0.2	0.0	1.6
Injury and poisoning	800-999	135	39.0	32.3	47.2
• Fractures, all sites	800-829	6	1.3	0.6	2.8
• Dislocations	830-839	0			
• Sprains and strains	840-848	58	17.1	12.8	22.9
• Intracranial injuries	850-854	0			
• Internal injuries	860-869	0			
• Open wounds	870-897	32	9.8	6.6	14.4
• Other injuries	900-999	39	10.9	7.7	15.4
Family status/health service contract	V01-V82	0			
• Family history of health problems	V10-V19	0			
• Circumstances related to reproduction/development	V20-V28	0			
• Specific procedure/aftercare	V50-V59	0			
Total minus pregnancies		154	44.9	37.5	53.6
TOTAL		154	44.9	37.5	53.6

Table 13.
OSHA-Recordable
Diseases and
Injuries by
Diagnostic
Category — Males
and Females

† Includes all diagnoses resulting from an OSHA-Recordable event.

* Standardized to age distribution of 1970 U.S. population.

Category of Diagnoses	ICD9-CM Code	Number of Diagnoses†	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Infections and parasitic diseases	001-139	0			
Malignant neoplasms	140-208, 230-234	0			
• Digestive organs	150-159	0			
• Respiratory system	160-165	0			
• Breast	174-175	0			
• Genitourinary	179-189	0			
• Nervous system	191-192	0			
• Leukemia, lymphoma	200-208	0			
Benign neoplasms and other	210-229, 235-239	0			
Endocrine and metabolic diseases	240-279	0			
Blood and blood-forming organs	280-289	0			
Mental disorders	290-319	1	0.3	0.0	1.9
• Alcoholism	303	0			
• Drug abuse	304-305	0			
Nervous system and sense organs	320-389	0			
Circulatory system	390-459	0			
• Hypertension	401	0			
• Acute myocardial infarction	410	0			
• Ischemic disease, not M.I.	411-414, 429.2	0			
• Cerebrovascular disease	430-438	0			
Respiratory system	460-519	0			
• Upper respiratory	460-465, 470-478	3	1.0	0.3	3.1
• Pneumonia/bronchitis	466, 480-487	0			
• Chronic respiratory conditions	490-496	1	0.3	0.0	2.3
Digestive system	520-579	1	0.3	0.0	2.3
• Hernias	550-553	1	0.3	0.0	1.9
• Gall bladder disease	574-575	1	0.3	0.0	1.9
Genitourinary system	580-629	0			
• Benign prostatic hypertrophy	600	0			
• Endometriosis	617	0			
• Ovarian cysts	620.0-620.2	0			
• Female genital pain/bleeding	625-626	0			
Pregnancy and childbirth ¹	630-676	0			
Skin and subcutaneous tissue	680-709	3	1.5	0.4	6.1
Musculoskeletal	710-739	2	1.3	0.3	6.3
• Dorsopathies system	720-724	0			
Congenital anomalies	740-759	0			
Certain perinatal conditions	760-779	0			
Symptoms, signs, and ill-defined conditions	780-799	1	0.3	0.0	2.3
Injury and poisoning	800-999	100	38.9	31.1	48.7
• Fractures, all sites	800-829	3	0.9	0.3	2.7
• Dislocations	830-839	0			
• Sprains and strains	840-848	39	14.6	10.3	20.7
• Intracranial injuries	850-854	0			
• Internal injuries	860-869	0			
• Open wounds	870-897	28	11.9	7.7	18.2
• Other injuries	900-999	30	11.6	7.7	17.5
Family status/health service contract	V01-V82	0			
• Family history of health problems	V10-V19	0			
• Circumstances related to reproduction/development	V20-V28	0			
• Specific procedure/aftercare	V50-V59	0			
TOTAL		111	43.7	35.3	54.0

Table 14.
OSHA-Recordable
Diseases and
Injuries by
Diagnostic
Category — Males

† Includes all diagnoses resulting from an OSHA-Recordable event.

* Standardized to age distribution of 1970 U.S. population.

Category of Diagnoses	ICD9-CM Code	Number of Diagnoses†	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Infections and parasitic diseases	001-139	0			
Malignant neoplasms	140-208, 230-234	0			
• Digestive organs	150-159	0			
• Respiratory system	160-165	0			
• Breast	174-175	0			
• Genitourinary	179-189	0			
• Nervous system	191-192	0			
• Leukemia, lymphoma	200-208	0			
Benign neoplasms and other	210-229, 235-239	0			
Endocrine and metabolic diseases	240-279	0			
Blood and blood-forming organs	280-289	0			
Mental disorders	290-319	1	0.7	0.1	4.8
• Alcoholism	303	0			
• Drug abuse	304-305	0			
Nervous system and sense organs	320-389	2	1.5	0.4	6.0
Circulatory system	390-459	0			
• Hypertension	401	0			
• Acute myocardial infarction	410	0			
• Ischemic disease, not M.I.	411-414, 429.2	0			
• Cerebrovascular disease	430-438	0			
Respiratory system	460-519	0			
• Upper respiratory	460-465, 470-478	0			
• Pneumonia/bronchitis	466, 480-487	0			
• Chronic respiratory conditions	490-496	0			
Digestive system	520-579	0			
• Hernias	550-553	0			
• Gall bladder disease	574-575	0			
Genitourinary system	580-629	0			
• Benign prostatic hypertrophy	600	0			
• Endometriosis	617	0			
• Ovarian cysts	620.0-620.2	0			
• Female genital pain/bleeding	625-626	0			
Pregnancy and childbirth	630-676	0			
Skin and subcutaneous tissue	680-709	5	5.9	2.2	15.8
Musculoskeletal	710-739	0			
• Dorsopathies system	720-724	0			
Congenital anomalies	740-759	0			
Certain perinatal conditions	760-779	0			
Symptoms, signs, and ill-defined conditions	780-799	0			
Injury and poisoning	800-999	35	39.0	27.0	56.5
• Fractures, all sites	800-829	3	2.3	0.7	7.2
• Dislocations	830-839	0			
• Sprains and strains	840-848	19	22.4	13.6	37.0
• Intracranial injuries	850-854	0			
• Internal injuries	860-869	0			
• Open wounds	870-897	4	4.2	1.4	12.5
• Other injuries	900-999	9	10.1	4.8	21.1
Family status/health service contract	V01-V82	0			
• Family history of health problems	V10-V19	0			
• Circumstances related to reproduction/development	V20-V28	0			
• Specific procedure/aftercare	V50-V59	0			
Total minus pregnancies		43	47.1	33.7	65.8
TOTAL		43	47.1	33.7	65.8

Table 15.
OSHA-Recordable
Diseases and
Injuries by
Diagnostic
Category —
Females

† Includes all diagnoses resulting from an OSHA-Recordable event.

* Standardized to age distribution of 1970 U.S. population.

OSHA-Recordable Diagnoses by Occupational Category, 1994

During 1994, the age-adjusted diagnosis rate among all employees (Table 16) was more than 3.5 times higher for hourly workers than for salaried workers (102.6 versus 26.7 per 1,000 persons). Service workers, who comprised 16% of the work force, had the highest diagnosis rate (107.7 per 1,000), with 59 diagnoses reported for 55 persons. The second highest diagnosis rate was among crafts and repair workers (71.9 per 1,000), with 28 diagnoses for 26 persons. Technical support workers (54.0 per 1,000) ranked third, with 38 diagnoses among 33 workers. The diagnosis rate for workers in the category of engineers, scientists, and health care workers was lower than all other occupational categories (10.5 per 1,000 workers), with 4 diagnoses among 4 workers.

Men. The diagnosis rate among men (Table 17) was more than four times higher for hourly workers (97.5 per 1,000) than for salaried workers (22.3 per 1,000). Service workers had the highest rate (102.4 per 1,000), with 43 diagnoses reported for 41 men. Crafts and repair workers ranked second (72.7 per 1,000), with 28 diagnoses among 26 men. Technical support workers followed, with 28 diagnoses for 24 men (48.3 per 1,000). As seen with the combined groups, engineers, scientists, and health care workers had the lowest rate (8.4 per 1,000), with 3 diagnoses reported for 3 men.

Women. The diagnosis rate among women (Table 18) was more than 3.5 times higher for the hourly workers (127.6 per 1,000) than for the

salaried workers (35.9 per 1,000). The highest diagnosis rate was for workers in the category of service workers (130.2 per 1,000), with 16 diagnoses reported among 14 women. Technical support workers (66.4 per 1,000) ranked second, with 10 diagnoses for 9 women. The third highest rate occurred in the category of office management and administration (31.1 per 1,000), with 16 diagnoses among 15 women. The diagnosis rate was the lowest among the crafts and repair workers, with no diagnoses reported.

	Occupational Category	Number of Workers	Number of Diagnoses†	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Salaried	Office Management and Administration	1,454	25	19.5	12.3	30.8
	Engineers, Scientists, and Health Care	404	4	10.5	3.8	29.0
	Technical Support	706	38	54.0	37.5	77.7
	Subtotal	2,564	67	26.7	20.5	34.8
Hourly	Service	545	59	107.7	79.9	145.2
	Crafts and Repair	293	28	71.9	49.3	104.9
	Subtotal	838	87	102.6	79.6	132.2
TOTAL	3,402	154	44.9	37.5	53.6	

Table 16.
OSHA Diagnoses by Occupational Category — Males and Females

	Occupational Category	Number of Workers	Number of Diagnoses†	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Salaried	Office Management and Administration	868	9	12.8	5.8	28.3
	Engineers, Scientists, and Health Care	333	3	8.4	2.6	27.0
	Technical Support	554	28	48.3	31.6	73.8
	Subtotal	1,755	40	22.3	15.8	31.5
Hourly	Service	438	43	102.4	72.1	145.4
	Crafts and Repair	290	28	72.7	49.9	106.0
	Subtotal	728	71	97.5	73.4	129.5
TOTAL	2,483	111	43.7	35.3	54.0	

Table 17.
OSHA Diagnoses by Occupational Category — Males

	Occupational Category	Number of Workers	Number of Diagnoses†	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Salaried	Office Management and Administration	586	16	31.1	17.8	54.6
	Engineers, Scientists, and Health Care	71	1	9.7	1.4	68.8
	Technical Support	152	10	66.4	32.8	134.2
	Subtotal	809	27	35.9	23.6	54.6
Hourly	Service	107	16	130.2	75.3	224.9
	Crafts and Repair	3	0			
	Subtotal	110	16	127.6	73.6	221.1
TOTAL	919	43	47.1	33.7	65.8	

Table 18.
OSHA Diagnoses by Occupational Category — Females

† Includes all diagnoses reported with an absence of 5 or more days, including absences for pregnancy and childbirth.

* Standardized to age distribution of 1970 U.S. population.

OSHA-Relative Risk for Selected Disease and Injury Categories by Occupation

The relative risk of an OSHA-recordable event for selected diagnostic categories among workers by each occupational category is shown in Tables 20.A through 20.E.

Examination of the tables shows that technical support workers were significantly more likely to have at least one OSHA event during 1994 for diseases of the skin and subcutaneous tissue (RR=8.0).

Service workers were significantly more likely to have at least one OSHA event during 1994 for injury

and poisoning (RR=3.7), as a whole; and sprains and strains (RR=7.0) and other injuries (RR=3.9), as subcategories of injury and poisoning. Crafts and repair workers were significantly more likely to have at least one OSHA event during 1994 for injury and poisoning (RR=2.5), as a whole; and open wounds (RR=6.0), as a subcategory of injury and poisoning.

Office management and administration workers had a statistically significant decreased risk of having an OSHA-recordable event due to

injury and poisoning (RR=0.2), as a whole; and sprains and strains (RR=0.2), open wounds (RR=0.1), and other injuries (RR=0.3), as subcategories of injury and poisoning. Engineers, scientists, and health care workers were also at a significantly decreased risk for injury and poisoning (RR=0.2).

Occupational Category	Person-Years	Persons with at Least One Event*	Relative Risk**	Lower 95% Confidence Limit	Upper 95% Confidence Limit
Office Management and Administration	1,454	1	0.1	0.02	1.2
Engineers, Scientists, and Health Care	404	0			
Technical Support	706	5	8.0	1.9	33.8
Service	545	1	0.7	0.1	5.4
Crafts and Repair	293	1	4.7	0.4	59.6
TOTAL	3,402	8			

*Table 19.A.
Diseases of the Skin and Subcutaneous Tissue*

Occupational Category	Person-Years	Persons with at Least One Event*	Relative Risk**	Lower 95% Confidence Limit	Upper 95% Confidence Limit
Office Management and Administration	1,454	19	0.2	0.1	0.4
Engineers, Scientists, and Health Care	404	4	0.2	0.1	0.6
Technical Support	706	28	1.1	0.7	1.7
Service	545	51	3.7	2.5	5.3
Crafts and Repair	293	24	2.5	1.6	4.0
TOTAL	3,402	126			

*Table 19.B.
Injury and Poisoning*

* Persons with multiple absences during the time period were counted only once.
** Adjusted for age and gender – compared with all occupational categories.

Occupational Category	Person-Years	Persons with at Least One Event*	Relative Risk**	Lower 95% Confidence Limit	Upper 95% Confidence Limit
Office Management and Administration	1,454	9	0.2	0.1	0.5
Engineers, Scientists, and Health Care	404	2	0.3	0.1	1.1
Technical Support	706	10	0.8	0.4	1.7
Service	545	30	7.0	4.0	12.1
Crafts and Repair	293	5	1.1	0.4	2.8
TOTAL	3,402	56			

Table 19.C.
Injury and Poisoning: Sprains and Strains

Occupational Category	Person-Years	Persons with at Least One Event*	Relative Risk**	Lower 95% Confidence Limit	Upper 95% Confidence Limit
Office Management and Administration	1,454	3	0.1	0.04	0.5
Engineers, Scientists, and Health Care	404	2	0.4	0.1	1.8
Technical Support	706	10	1.7	0.8	3.6
Service	545	5	0.9	0.3	2.4
Crafts and Repair	293	12	6.0	2.8	13.1
TOTAL	3,402	32			

Table 19.D.
Injury and Poisoning: Open Wounds

Occupational Category	Person-Years	Persons with at Least One Event*	Relative Risk**	Lower 95% Confidence Limit	Upper 95% Confidence Limit
Office Management and Administration	1,454	6	0.3	0.1	0.7
Engineers, Scientists, and Health Care	404	0			
Technical Support	706	8	1.1	0.5	2.5
Service	545	15	3.9	2.0	7.7
Crafts and Repair	293	6	2.1	0.8	5.2
TOTAL	3,402	35			

Table 19.E.
Injury and Poisoning: Other Injuries

* Persons with multiple absences during the time period were counted only once.

** Adjusted for age and gender – compared with all occupational categories.

OSHA-Recordable Relative Risk for All Diseases and Injuries by Occupation

In Tables 19.A through 19.E, and 20, the risk of one or more OSHA-recordable events associated with selected diagnostic categories for specific occupational categories is compared with all other occupational categories in the Pantex workforce. This comparison takes into account the possible confounding effects of age and gender.

In contrast to the previous series of tables, these analyses examine the risk of a worker having *one or more* OSHA-recordable events during 1994. This was done to minimize the problem associated with one person having multiple events for the same condition. Again, the statistical methods used to compare the incidence of events are the relative risk and the 95% confidence interval.

Service workers (RR=3.4) and crafts and repair workers (RR=2.5) had statistically significant increased risks of an OSHA-recordable event in 1994 (Table 19). Office management and administration workers (RR=0.2) and engineers, scientists, and health care workers (RR=0.2) had a statistically significant decreased risk of an event.

Occupational Category	Person-Years	Persons with at Least One Event*	Relative Risk**	Lower 95% Confidence Limit	Upper 95% Confidence Limit
Office Management and Administration	1,454	24	0.2	0.1	0.4
Engineers, Scientists, and Health Care	404	4	0.2	0.1	0.6
Technical Support	706	33	1.2	0.8	1.7
Service	545	55	3.4	2.4	4.8
Crafts and Repair	293	26	2.5	1.6	4.0
TOTAL	3,402	142			

Table 20. All OSHA Diseases and Injuries by Occupational Categories

* Persons with multiple absences during the time period were counted only once.
 ** Adjusted for age and gender – compared with all occupational categories.

DIAGNOSTIC CATEGORIES

Category of Diagnoses	ICD-9-CM Code	Types of Illness in Category
All conditions	001-V82	All reported health events.
Infectious and parasitic diseases	001-139	Diseases caused by bacteria, viruses, and parasites.
Malignant neoplasms	140-208, 230-234	All cancers, regardless of the part of the body affected.
Benign neoplasms and neoplasms of uncertain behavior and unspecified nature	210-229, 235-239	Tumors that are not cancerous or that do not exhibit clearly malignant behavior, regardless of the part of the body affected.
Endocrine, nutritional and metabolic diseases, and disorders of the immune system	240-279	Diseases and conditions affecting the hormone secreting glands and organs; nutritional disorders, such as vitamin deficiency; metabolic diseases, such as diabetes and gout; and problems affecting the antibody producing system.
Diseases of the blood and blood-forming organs	280-289	Includes anemia and hemophilia, but excludes leukemia.
Mental disorders	290-319	Psychiatric diagnoses, such as dementia, schizophrenia, depression, and anxiety disorders; alcoholism; drug dependence; and eating disorders, such as bulimia.
Diseases of the nervous system and sense organs	320-389	Diseases affecting the brain, spinal cord, and peripheral nerves. Examples include meningitis; encephalitis; hereditary diseases, such as Huntington's chorea; Alzheimer's and Parkinson's disease; epilepsy; multiple sclerosis; migraine; diseases of the eye, such as cataract and glaucoma; and diseases of the ear, such as conductive hearing loss and otitis.
Diseases of the circulatory system	390-459	Diseases involving the heart, arteries, veins, and lymphatic system. Examples include rheumatic fever, heart murmurs, heart attacks, angina, hardening of the arteries, varicose veins, hemorrhoids, and phlebitis.
Diseases of the respiratory system	460-519	Includes colds, sinusitis, laryngitis, pneumonia and influenza, chronic bronchitis, asthma, and emphysema.
Diseases of the digestive system	520-579	Diseases affecting the teeth and mouth, salivary glands, digestive tract, and the abdominal cavity. Examples include dental abscess, ulcers, appendicitis, hepatitis (excluding viral hepatitis), cirrhosis of the liver, gallstones, pancreatitis, abdominal hernia, and intestinal polyps.
Diseases of the genitourinary system	580-629	Diseases affecting the kidneys, the prostate, and testes; benign breast diseases; infertility (male and female); pelvic inflammatory disease; diseases of the ovary; and menstrual disorders.
Complications of pregnancy, childbirth, and puerperium	630-676	Includes miscarriage; complications of pregnancy, such as hemorrhage; pregnancy-related high blood pressure; pre-eclampsia; premature labor or other complications of labor.
Diseases of the skin and subcutaneous tissue	680-709	Includes acne, cellulitis, sunburn, psoriasis, and seborrhea.
Diseases of the musculoskeletal system and connective tissue	710-739	Includes arthritis, systemic lupus erythematosus, ankylosing spondylitis, herniated intervertebral disc ("slipped disc"), lumbago, sciatica, rheumatism, tendonitis, and osteoporosis.
Congenital anomalies	740-759	Abnormal anatomical development present at birth. Includes spina bifida, cleft palate, harelip, and various chromosomal anomalies, such as Klinefelter's syndrome.
Certain conditions originating in the perinatal period	760-779	Conditions or diseases of the mother that can produce perinatal illness or death of the fetus or newborn. Examples include maternal high blood pressure, maternal malnutrition, ectopic pregnancy, and breech birth. Also includes other conditions originating in the perinatal period, such as fetal malnutrition or slow growth, injuries related to birth trauma, and perinatal jaundice.
Symptoms, signs, and ill-defined conditions	780-799	Symptoms, signs, abnormal results of laboratory or other tests, and conditions for which no specific diagnosis has been made. Examples include blackout, chills, dizziness, fatigue, pallor, abnormal weight loss, undiagnosed chest pain, and heartburn.
Injury and poisoning	800-999	Dislocation of joints; sprains and strains of joints and associated muscles; concussions; bruises; cuts; internal injuries due to crushing, puncture, tearing, or blunt impact; burns; blisters; poisoning; frostbite; heat stroke; and complications of medical or surgical care.
Fractures, all sites	800-829	Cracks or breaks of any bone.
Dislocations	830-839	Separation of a bone from its normal socket or joint.
Sprains and strains of joints and adjacent muscles	840-848	Strains include injuries to muscle from overexertion or from stretching the muscle beyond its normal limit. Sprains include injuries involving tearing or overextending the ligaments of a joint.
Intracranial injuries excluding those with skull fractures	850-854	Includes concussions, internal bruises, and hemorrhages within the skull without a fracture of the bones of the skull.
Internal injuries of the chest, abdomen, and pelvis	860-869	Includes internal injuries to the chest, abdomen, and pelvis and the organs within these areas of the body that do not involve an open wound.
Open wounds	870-897	Includes animal bites, cuts, lacerations, punctures, and amputations, excluding the arteries and veins.
Other injuries and effects of external causes	900-999	Miscellaneous injuries, including injuries to the arteries and veins, problems that occur an extended period of time after the injury has taken place ("late effects"), superficial bruises and abrasions, burns, post-injury shock, poisoning, toxic side effects of chemicals, heat stroke, electrocution, and altitude sickness.
Motor vehicle traffic accidents	E810-E819	Includes accidents involving motor vehicles alone or with other motor vehicles, pedestrians, or vehicles operated by pedals.
Other accidents	E916-E928	Includes accidents involving falling objects or machinery; accidents related to explosions; and those related to electrical current, radiation, hot or corrosive substances, noise, and overexertion.
Supplementary classifications related to personal or family history of disease	V10-V19	Covers situations in which the person is not ill or injured but has a personal or family history of problems, such as cancer, mental illness, allergies, or arthritis, that may affect his or her risk of illness.
Supplementary classifications related to health care for reproduction and child development	V20-V28	Includes problems related to pregnancy, postpartum care, contraception, outcome of delivery, and physical development of child.
Contact with health services for reasons other than illness or injury	V50-V59	Includes care for workers who have been treated previously for an illness or injury that is no longer present but who receive care to complete treatment or prevent recurrence.

GLOSSARY

Adjustment - A mathematical procedure for rates in which the effects of differences (such as age) in groups have been removed. The purpose of adjustment is to allow comparisons between two or more groups.

Epidemiologic Surveillance - The regular and systematic collection of data and interpretation of the distribution of illness, injury, and death in the DOE labor force over time.

ICD-9-CM - The ICD-9-CM (International Classification of Diseases-9th Revision-Clinical Modification) is based on the ICD-9 originally published by the World Health Organization and widely accepted as a standard for the coding of cause of death. The ICD-9-CM is required for the reporting of morbidity to all U.S. Public Health Service programs.

Diagnoses Rate - The number of new, reported health events observed among DOE workers per thousand DOE workers at risk during a given period of time.

Person-year - A unit of measurement combining persons and time equivalent to one person followed up for one year. In Epidemiologic Surveillance reports, rates are often expressed as the number of events (e.g., illness absences, injuries) per 1,000 person-years.

STATISTICAL NOTE

The age-adjusted rate was calculated using the 1970 U.S. population. The age-adjusted rate represents the hypothetical rate that would have been observed if the 1993 group had the same age distribution as the 1970 U.S. population. The age-adjusted rate is used to compare populations that differ in age. The 1970 U.S. population was selected because it is the standard most used for published morbidity data.

The illness and injury absence rate is defined as an absence due to illness or injury of 5 or more consecutive work days, divided by the total number of workers. OSHA-recordable events may or may not involve an absence from work.

The 95% confidence interval is based on the normal approximation to the binomial distribution where the calculated illness and injury absence rate falls within the interval. The true rate lies within this interval 95% of the time.